



NCTR

NATIONAL CENTER for
TRANSIT RESEARCH

**Program Progress Performance Report
for University Transportation Centers
National Center for Transit Research (NCTR)
University of South Florida
a Tier I Transit Focused University Transportation Center**

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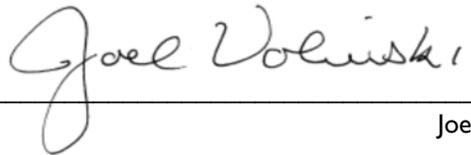
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Signature of Submitting Official: _____



Joel Volinski, NCTR Program Director

Accomplishments

What are the major goals and objectives of the program?

The major goals of the National Center for Transit Research are:

- To select and conduct research intended to make public transit and alternative means of transportation safe, efficient, effective, desirable, and secure. This will be done by receiving input from the Federal Transit Administration, the Florida Department of Transportation, the Illinois Department of Transportation, the North Dakota Department of Transportation, and transit professionals from throughout Florida and the nation. Research will be subject to peer review.
- To contribute to the education and preparation of the next generation of transportation professionals and to workforce development initiatives that will help attract, retain, and train employees in the fields of public transportation in particular.
- To disseminate the results of research as broadly as possible to fulfill the goal of making public transportation and alternative forms of transportation safe, efficient, effective, desirable, and secure. In addition, NCTR will continue to invest in projects that result in new patents and licenses that advance the quality of transportation services while creating new technology and employment opportunities.

What was accomplished under these goals?

During the fifth six month reporting period (July 1, 2014 – December 31, 2014) all consortium partners have completed or are substantially engaged in all of the federally funded research projects they lead or participate in as summarized below:

Evaluating the State of Mobility Management and Human Service Transportation Coordination – NDSU as the lead with assistance from USF and UIC (based on FTA proposal) - Objectives are to 1) Synthesize previous research on the effectiveness of mobility management and coordination programs; 2) Develop an onboard survey instrument that could be used in different locations and across time to evaluate the impacts of mobility management and coordination programs on end users; 3) Determine the impacts of mobility management and coordination programs in meeting the goals of efficiency, ease of access, and quality of service; 4) Assess the effectiveness of mobility management and coordination programs in meeting the needs of transportation disadvantaged populations from the perspective of the end users; and 5) Develop and test an evaluation model that could be applied to other communities across the country. **All tasks were completed and a final report was produced during this time period and posted to the websites of NCTR and the Small Urban and Rural Transit Center.** Jeremy Mattson presented findings from research on evaluating mobility management and human service transportation coordination at the National Conference on Rural Public and Intercity Bus Transportation in Monterey, California in October 2014.

Improving Veteran Mobility in Small Urban & Rural Areas – NDSU- The objective of this research is to identify veterans with mobility needs currently living in rural North Dakota, South Dakota, and Montana. The cost of providing different transportation options are quantified in relation to meeting their medical needs as well as other life essential activities. **This project was completed as reported in the previous six month PPPR.** Del Peterson presented findings from research on veteran mobility in small urban and rural areas at the National Conference on Rural and Intercity Transportation in

Monterey, California in October 2014. He also presented this as part of the USF Transportation Webinar series hosted by the Center for Urban Transportation Research on July 10, 2014.

2013 Rural Transit Fact Book – NDSU - The rural transit fact book serves as a national resource for statistics and information on rural transit in America. It includes information on demographic and travel behavior data as well as financial and operating statistics for agencies receiving 5311 funding. Needs and resources were identified, the data were collected, and data analysis was completed. **A final report was completed during the previous six month reporting period and was posted to the NCTR and the SURTC websites.**

Cost-Benefit Analysis of Rural and Small Urban Transit – NDSU – **This project was completed during the previous six month time period**, the report posted to websites of USF and NDSU, and results were shared at the Transportation Research Forum Annual Meeting in San Jose, California and via an NCTR webinar.

Intercity Transit Services Demand in North Dakota – NDSU - This study will create an intercity bus network model for the Upper Midwest that will be used to estimate boardings at each stop and ridership on each link in the network and the impacts of possible service changes and population changes on ridership. Changes were made to the methodology, additional lit review was conducted, and a survey instrument was developed to collect data. This project is approximately 60% complete, with completion expected in August of 2015.

National Transit Demand Response Level of Service – NDSU - The primary objective of the study is to develop a method for assessing the national demand response level of service. This project is approximately 60% complete, with the North Dakota surveying complete. It is expected to be completed in July 2015.

Development of Public Transit II Course – NDSU - A new course, Public Transit II, will be developed and offered in spring 2015 as part of NDSU's Transportation and Logistics program. This class will expand upon TL 786, the public transportation class currently offered at NDSU, by going more in-depth in some quantitative and technical topics covering more advanced areas including modeling, economics, and engineering. Topic areas will be chosen based on the expertise of the instructors and input received from the operators and consultants to the transit industry and will address areas not currently covered in TL 786. Significant progress was made in developing lecture notes and class materials and activities. The new class was approved by the Faculty Senate and can now be offered, and will be offered in Spring of 2016.

National Transit Network Level of Service Data and Analysis – USF as lead with assistance from UIC (based on FTA proposal) – **The following tasks have been completed:** Evaluate the state of GTFS data utilization; develop a schema for maintaining a National GTFS dataset; and develop GTFS based measures on mobility and accessibility. The remaining tasks include: Conduct a National GTFS Based Mobility Evaluation; Conduct a National GTFS Temporal Based Accessibility Evaluation; and Recommendation for the establishment of a National Transit Service Database. Completion is expected in March of 2016.

Texas Transportation Institute Annual Congestion Study: Measuring Transit's Impact – USF - The methodology report and analysis developed by USF were completed in the previous reporting period and that document is published (<http://d2dtl5nnlpfr0r.cloudfront.net/swuttc.tamu.edu/publications/technicalreports/600451-00013-1.pdf>). USF has subsequently updated the base year data provided to TTI. It is our understanding TTI will be producing their annual urban mobility report in Spring of 2015, after they have improved a new data set that will help provide a more accurate report. USF specifically collaborated with TTI and utilized a great deal of APTA data as well as USDOT data. It is believed the improved methodology will enhance the credibility of the report and provide a more realistic measure of the impact transit service has on roadway congestion.

Incorporating Managing Demand into Washington State DOT Planning and Programming – USF - The objective of this research is to develop guidelines for WSDOT business areas to identify and select potential demand management strategies appropriate to the context of the land use and transportation environment to meet their objectives. The anticipated benefits from this research include increasing capacity in the WSDOT transportation system by expanding participation in alternative modes (carpools, vanpools, transit, cycling, walking, and telecommuting). A technical memorandum was prepared based on an extensive literature review and series of in-person interviews. It was submitted to WSDOT September 2014. The tech memo included analysis of documents used for planning in different WSDOT business areas as well as national efforts in the integration of transportation demand management (TDM) into the WSDOT transportation planning process and tools for evaluating the impacts of TDM. A draft report of guidance to incorporate TDM into planning processes was transmitted to WSDOT December 2014. This draft guidance included recommendations on how to consider TDM as part of planning in the following areas:

1. Washington Transportation Plan and the WSTC
2. WTP Statewide TDM Policy
3. Statewide Multimodal Transportation Planning
4. Commute Trip Reduction Program
5. State-Owned Facilities
6. Highway System Plan
7. State Public Transportation Plan
8. Corridor Studies
9. Programming
10. Funding
11. Construction Mitigation
12. Growth Management Act
13. State Environmental Policy Act

National Transit Safety Research and Assistance Center – USF – The website for this center was created during the prior six month reporting period as a comprehensive transit safety resource (<http://transitsafetycenter.org/>). During the six month reporting period there were a total of 1053 page views. The most popular page (besides the homepage) with 104 page views was the page on Epidemics and Pandemics . The second most popular page was the research page with 51 page views. The Center employs a number of methods to successfully provide resources to public transportation providers, local and state governments, the private sector, and other transit stakeholders to improve public transportation safety in the United States. The focus areas include operational and vehicle related safety topics, human factors, and substance abuse management. Technical assistance and training aspects are

structured to provide ample support to transit agencies that are transitioning to a Safety Management Systems approach to safety as well as those agencies responding to MAP-21 and corresponding regulations, guidelines, and other directives issued by the Federal Transit Administration. There are links to safety-related research reports and other resources, as well as training offered by groups such as the Transportation Safety Institute and the National Transit Institute. A comprehensive inventory of federal and state transit safety laws and regulations is provided as a resource on the site. In addition to the written report that summarizes federal and state transit safety laws, from the “Regulations and Standards” link on the home page, individuals may select a specific state from an interactive map of the United States and have access to the laws and regulations of that state which was developed in this six month reporting period. The Center was also asked to (and started to) develop and maintain a multi-faceted resource website for the Transportation Research Board Task Force on Transit Safety and Security to serve, not only as a resource to Task Force members, but to transit agency personnel and others interested in the safety and security of our national public transit systems. This is a continuously funded center through NCTR and will remain so throughout the life of this grant and successor grants.

Alternative Fuels Clearinghouse – USF – Renamed the Advanced Transit Energy Portal (ATEP), it is an online information exchange resource covering all aspects of adoption and operation of the alternative fuel buses in the U.S. transit fleet. The website: www.advancedtransitenergy.org has been up and running since October 2013. In the past 6 months the following activity has taken place:

- Regular posts on the website in the following categories: agency news, industry news, events, laws and incentives, publications, and research results.
- Made presentation about ATEP to NCTR Advisory Board – October 23, 2014
- Made presentation to US DOE representatives visiting CUTR – November 17, 2014
- Completed and tested data collection page
- Identified a list of major agencies with alternative fuels (from different regions of US), compiled contact information of maintenance managers to solicit data
- Requested help from American Bus Benchmarking Group in data collection effort

National Transportation Demand Management and Telework Clearinghouse – USF - This project includes information about alternatives to driving alone and telework programs to meet the congestion, air quality, and mobility challenges facing our communities. The Clearinghouse provides the most comprehensive information related to TDM services and products such as ridesharing systems and marketing materials; commuter tax benefit information for employers; free TRIMMS™ software to predict the impacts of trip reduction programs; manages “Best Workplaces for Commuters” that recognizes employers that provide significant commute friendly benefits to employees. During this period, NCTR staff planned the Best Workplaces for Commuters’ **Race to Excellence** awards program. The Race to Excellence is an annual challenge that encourages, recognizes, and highlights dedicated TDM professionals across the country that promote commuter benefits, transportation options, and the Best Workplaces for Commuters (BWC) designation in their workplaces and throughout their local communities. The organizations who successfully complete the Race take exemplary steps to offer their

employees viable alternatives to driving alone, thereby reducing air pollution, traffic congestion, and fuel consumption. The Virtual Awards Ceremony will be held on January 29, 2015.

NCTR manages the TRANSP-TDM listserv to foster nearly instantaneous peer-to-peer interactions among TDM professionals across the world. Since this internationally renowned listserv was started in late 1998 by FDOT and CUTR, the listserv has grown to over 2,400 active members. The Clearinghouse also supports TDM-related listservs (e.g., telework, parking management, sustainable transportation, etc.)

On October 9, 2014, the Clearinghouse's Best Workplaces for Commuters (BWC) and the Association for Commuter Transportation (ACT) co-sponsored the ***Travel Behavior Change and New Social Justice Issues*** netconference. This event discussed how community-based marketing and outreach initiatives can be effectively used to grow support for behavior change in favor of active transportation choices in diverse communities. Unfortunately, not everyone participates equally in the positive outcomes of these efforts and the damage done is not easily erased. Two speakers helped to shed light on these social justice issues and approaches used in their communities. Dan Kaempff, Principal Transportation Planner at Metro, discussed how Portland led the way for many in developing an active transportation focused region and found the need to correct unintended social injustice, gentrification, and outright neglect that occurred in the process. Emma Pachuta, program manager of St. Paul Smart Trips Neighborhoods, explained how they overcame language barriers, infrastructure inadequacies, community safety concerns, and income inequalities in fostering increased walking, biking, and transit use.

GIS in Transit Clearinghouse - USF - The Transit GIS Clearinghouse was created by the National Center for Transit Research (NCTR). It is an outgrowth of the NCTR-sponsored GIS in Transit Conference. This site is managed by the staff of the GIS and Transportation Informatics Group at the Center for Urban Transportation Research. Moreover, the Clearinghouse's purpose is to share innovative GIS solutions and how they can improve public transportation. This site seeks to reach out to the public transit industry, and maintain a repository of data and information that keeps professionals abreast of the latest developments, innovations, and research from a holistic point-of-view. It continues to serve the purpose of allowing information sharing among professionals in GIS throughout the world, and keeps visitors posted on upcoming events and new articles dealing with GIS applications in the field of public transportation. During the six month reporting period the Clearinghouse actively planned the 2015 Transit GIS Conference being held in Washington, DC on September 1-3, 2015. This unique conference is for transit planners, managers, researchers and GIS industry experts who are interested in sharing ways to use geographic and spatial analysis in transit planning, operations, and marketing to increase efficiency and effectiveness. The objectives of the conference are to:

- Provide transit professionals with experience and interest in GIS an opportunity to learn from peers and industry experts (vendors, researchers, and practitioners)
- Discuss emerging trends in geo-spatial analysis and transit informatics
- Demonstrate the use of GIS data to improve transit efficiency and effectiveness
- Provide a forum for public-private discussions about practical applications of new technologies

Development of Training Manuals for Transit Planning and Scheduling – FIU – A draft final report was prepared during the six month reporting period. It will be reviewed and edited and published during the next reporting period.

Transit Service Reliability: Analyzing Automatic Vehicle Location (AVL) Data for On Time Performance and to Identify Conditions Leading to Service Degradation – FIU as the lead with assistance from USF (based on FTA proposal) - During this time, the focus was mainly on the Assessment of AVL systems and Datasets, Challenges and Opportunities, and Development of Methodology (Tasks 2,3,4). Much of the research was dedicated to understanding the General Transit Feed Specification (GTFS) for both static and real-time datasets. This is important because GTFS data will be used for the development of the methodology and creation of the framework. For this research, data from Hillsborough Area Regional Transit's GTFS will be used for addressing both the transit on-time performance and for identifying conditions towards service degradation. The development of the methodology is a key task in this project, as it will be the basis for the creation of the framework that can help transit agencies improve their service reliability.

State of Good Repair Performance Measures: Assessing Asset Condition, Age, and Performance Data – FIU - This research is intended to facilitate keeping transit assets in a state of good repair by using objective performance measures for measuring the condition of capital assets. To improve efficiencies, there is a need to have an ongoing process of asset management that can be assisted with a software application. Using data in an asset management system can help prioritize investments based on limited resources and the assets' condition. The main objective of this scope of work is to develop a web-based software application that transit agencies can use for the collection, storage, querying, analysis, and reporting of transit assets: Enterprise Transit Asset Management (ETAM). The idea is to develop a system in which different departments at the transit agencies can access the system for entering data, analyzing, or for retrieving information. Therefore, this tool can assist transit agencies in evaluating and assessing transit asset data with regard to age, condition, and performance against established performance targets as well as an approach for project prioritization based on budget data and asset rehabilitation/replacement alternatives. During the reporting period the research team collected several documents, attended three webinars, and began the literature review which includes FTA reports, TRB papers, and other related documents. The team also started to design the Graphical User Interface (GUI) for the web-based application that will be created under this project. The project team looked into the data flow, web site structure, database, and asset management elements, and created a few mock up layouts as the GUI for the future web application.

The Challenges to Creating Transit Value Capture by linking Transit Investment, Station Area Planning, Attraction of Appropriate Development, and the Application of Effective Value Capture Tools – UIC - The focus was on completing case study visits as well as documenting the case studies and literature review. Real estate developer information gathering was completed during this period as well as interviews with stakeholders. The draft final report was completed after the completion of the interviews with stakeholders, underwent reviews, and is expected to be published during the next reporting period. The project team submitted preliminary papers to TRB and APTA for consideration in conferences, and presenting findings in various forums. Findings of the research were presented as part of the CUTR/NCTR's webinar series, a presentation that was valid for AICP credit.

Adapting Transit to Climate Change Impacts – UIC as the lead with assistance from USF (based on FTA proposal) - The work completed in the six month reporting period included: The final regression model was completed as well as preliminary statistical analysis and modeling of ridership as a function of temperature and station platform coverage (canopy). The PI also worked on the manuscript model and continued to integrate the findings into a decision model. The research team is currently in the process

of documenting the results and the policy implications for the Chicago Transit Authority. A paper was also finished based on the initial results and is being submitted for publication.

Green Transportation Programs in the Healthcare Sector: Best Practices and Potential Opportunities

This project, approved to proceed in this reporting period, will investigate the potential opportunities of reducing transportation-related carbon footprint from healthcare facilities. It will refer to the findings from previous surveys of three hospitals in Chicago and expand to a nation-wide study. It will identify best practices of alternative transportation programs adopted in the healthcare sector and conduct in-depth case studies. In particular, it will explore the impetus for developing, sustaining, and growing green commuting programs, financing mechanism, results and observed benefits, as well as challenges in those institutions. It will also evaluate the cost effectiveness of various transportation programs, and scale up environmental impacts from single hospitals to the region and nation, considering the growing trend of the health care sector in terms of both facilities and employees. This project is expected to deliver (1) best-practice references for the health care sector with a focus on its design and implementation of facility siting and employer-sponsored transportation programs; (2) policy recommendations and data references for municipal and regional planning agencies to incorporate healthcare facilities into regional transportation demand management; and (3) conference and journal publications. During this reporting period, the PIs completed surveys in all three participating hospitals and finalized data analysis, including summary statistics of healthcare professionals' commuting patterns in selected hospitals, interviewees' perspectives on sustainable transportation in their workplace, and spatial analysis in GIS.

An Online Tool for Computing and Presenting Regional Accessibility Measures

This project, approved to proceed in this reporting period, aims to develop innovative metrics for measuring *transit and multimodal accessibility* in the Chicago metropolitan region and integrating these measures into an open online interactive tool for use by planners. The project will look at access to jobs as well access to activities key for livable communities – schools, parks, shopping, etc. One of the goals of the project is to complement often used measures of accessibility that focus on one transportation mode with a multimodal perspective. In addition, it seeks to develop measures that take into consideration resident's capabilities to undertake travel as described by car ownership rates, disability, age, and income. Such a combined approach would help properly prioritize areas lacking in accessibility. The project will also integrate healthy transportation choices (walking, bicycling) into the multimodal measure of access for residents – an approach which also seeks to disentangle issues related to last-mile problems. Metropolitan planning agencies as well as other smaller cities and municipalities, who may not have the manpower or tools to perform these tasks, can leverage the online tool in their assessment of transportation and land use in their jurisdictions. During this reporting period, several data sets were collected that included the transit accessibility data for the metropolitan Chicago area. Project PIs also calculated automobile travel time matrix for each block group in Chicago using an Open Source Routing Machine (OSRM). The accessibility data for an automobile was also calculated, based on the matrix and job data. A sample website was built using Chicago tract accessibility data to demonstrate potential outcome of results.

Optimal Rail Service Planning in a Passenger-Freight Shared Corridor

Shared rail corridors that provide both passenger and freight transportation services are an important feature in the U.S. rail transportation system. The shared use of rail trackage by passenger and freight trains, on the one hand, enhances capacity utilization of the existing rail infrastructure. On the other hand, the joint consumption of available capacity of a corridor are associated with scheduling issues and potential train delay increase, given the heterogeneity of passenger and freight rail traffic, as characterized by the speed differences among different train types (freight trains often operates much slower than passenger trains, and particularly so in higher-speed rail corridors), the inherent peaking nature of passenger demand, and logistics requirement for rail freight delivery. This study proposes an integrated, hypergraph-based approach that attempts to minimize the system costs (train operating cost, passenger in-vehicle travel time, waiting time, delay, etc.) within a shared rail corridor, while meeting the operating requirements (e.g. safety, train priority, effective scheduling) and other constraints from infrastructure supply as well as passenger and freight demand. Different from previous studies, the project explicitly examines the impact on train scheduling of the stochastic behavior of freight trains and passenger demand profiles. By incorporating realistic cost factors, the planning model will be applied to the Chicago-St Louis Higher Speed Rail and Chicago Metra Rail lines. Results from the case study will shed lights on the planning, operation, and infrastructure investment decisions in shared corridor rail service in the Chicago region, Illinois, and the rest of the country. During this reporting period, the formulation developed for scheduling trains on shared corridors was able to solve a large problem with two stations (one for each end) within reasonable time. The model was extended to account for stops at intermediate stations. In addition, the project studied the impact on freight cost components of speed heterogeneity. A final draft report was completed during this reporting period.

Examining Pedestrian Behavior at Railroad Crossings - Data collection at selected CTA rail grade crossing was completed. The data consisted of interviews with non-motorized users as well as video monitoring of non-motorized activity at each crossing. The data is being prepared for analysis. The literature review was begun during this reporting period.

CPS Travel Training Evaluation Project

Public transportation and public educational programs are mandated to provide transportation services for mentally and physically disabled individuals. While programs to transport members of disabled populations are important to ensure access and participation in important educational and work related activities, they are often highly expensive to operate. Moreover, they do not necessarily increase the independence of disabled clients. For these reasons, transit agencies, employers and educational institutions have begun to develop training programs to teach qualified clients how to use the fixed public transit system. Movement of disabled riders to fixed public transit systems reduces demand of costly paratransit programs, increases the ability of disabled clients to function independently, and may have a multitude of other benefits.

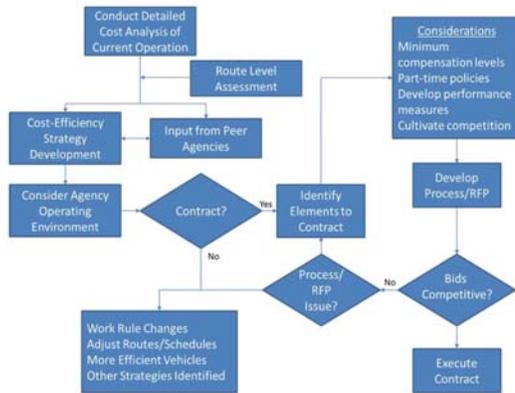
Travel training programs (TTP), particularly those offered by public school systems, are in their infancy. Chicago Public School's (CPS) TTP is one of the oldest in existence. While there is ad hoc evidence that these programs are beneficial in many respects, to date there has been little effort to formally assess the costs and benefits of these programs. Given this lack of evidence and within a constant context of fiscal constraint, travel training programs are consistently vulnerable to closure.

In response, this project will undertake systematic effort to assess the benefits and costs of the CPS TTP. The project will be conducted in two tracks: evaluation of a prior TTP for specialty schools that operated on a limited basis and the design of an evaluation plan for the recently-established system-wide travel training program. These two tracks will be conducted sequentially, the first informing the second. The ultimate result of the project will be an assessment report on the costs and benefits of the prior TTP and an evaluation plan, complete with methods and metrics, for the newly established system wide TTP. The scope for the project was developed and approved during this six month reporting period, and work on communicating with Chicago schools has been started.

Many other projects have either been completed or are being completed using matching funds from the Departments of Transportation of the consortium members. Research projects are scheduled to be completed from December 2014 to December 2015, while the Clearinghouse activities will be ongoing throughout the term of the grant.

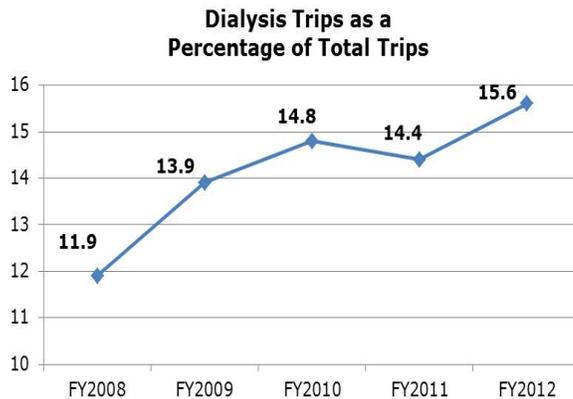
Provided below is a list of the projects funded by the Florida Department of Transportation (FDOT) that have been undertaken **at USF** as match to the grant:

1. **Florida Transportation Demand Management Clearinghouse** - \$143,325 – This ongoing project has been in place for 15 years, with results similar to those noted above for the National TDM and Telework Clearinghouse, with a focus on Florida applications. (Ongoing)
2. **Improving the Cost Effectiveness of Financial Incentives in Managing TDM** – This project was completed in October 2013. While mode shift away from driving alone is the primary purpose of most of the TDM incentive programs reviewed, there are other means for yielding the desired outcomes without shifting mode. One method is to shift the focus on the time of the trip or the quantity of the trip consumed (i.e., vehicle miles of travel (VMY)). Researchers focused on the evaluation of the feasibility of reducing individual VMT rather than changing mode as a means of achieving the outcomes of reduced congestion and emissions. A pilot test was conducted and proved that a VMT saving approach is very effective and has great potential to grow to achieve several of the desired outcomes of TDM. Two different incentive schemes in the pilot test produced valuable insights to expand the approach to statewide TDM programs.
3. **Analysis of Transit Contracting Models and Proper Incentives for Long-term Success** - \$137,074 - This research project was also completed and accepted by FDOT in November 2013. It was prepared at the request of FDOT to provide all operating transit agencies with techniques to consider should they be interested in contracting for more service in the future.



4. **Improved Traffic Control Measures to Prevent Incorrect Turns at Highway-Rail Grade Crossings** - \$99,033.88 – **This project was completed** in December 2013. FDOT has accepted the recommendations from the study and intends to apply them at additional sites throughout the state.

5. **Impacts of Dialysis Transportation on Florida's Coordinated Public Transportation Programs** - \$115,100 – FDOT accepted the final report in April 2014. It has helped them to understand the growing demand for paratransit services for those needing dialysis treatment. The report identified numerous ways that local agencies are dealing with the growing demand. This information sharing can help agencies serve as many people as possible while addressing the urgent needs of dialysis patients for transportation.



6. **Bus Operator Safety Critical Issues Examination and Model Practices** - \$242,005 – This project was completed and enthusiastically accepted by FDOT in January 2014. FDOT will fund continuing transit safety research and training as a result of this report. Findings have been presented at three professional transit conferences in two countries.



7. **Evaluation of Rear-end Bus Collisions and Identifying Possible Solutions and Assessing the Effectiveness of Bus Pull-out Bays in Reducing Collisions** - \$150,000 – This project was completed in March 2014. Results were presented at the Florida Public Transportation Association Professional Development Workshop in June, and via webinar hosted by the Center for Urban Transportation Research in June.



8. **Best Practices in Enhancing Transit in Multimodal Transportation Elements** - \$174,871 – **This report was completed** and accepted by the Florida Department of Transportation in June 2014. This report provides guidance in developing a multimodal transportation element of a local government comprehensive plan. Two model elements were developed that encourage a range of best practices in multimodal transportation planning as identified through a review of the literature, agency plans, and related documents. Emphasis is placed on ensuring a multimodal transportation system appropriate to the size and character of the community, providing for public transportation as feasible, improving accessibility and connectivity between modes, and coordination with land use and plans of other transportation agencies and modal providers. Contents include guidance on establishing a community vision and priorities, relevant and professionally accepted data sources and analysis procedures/tools, guidance on existing and future conditions analysis and mapping, establishing quality/ level of service standards and other performance measures or benchmarks, future transportation system network planning strategies, and example goals, objectives, policies, and strategies.



9. **Investigation, Quantification, and Recommendations - Performance of Alternately-fueled Buses** - \$140,000 – **This project was completed during the six month reporting period (August 2014).** Information from this report helps to inform the clearinghouse activities that are funded through the federal side of the grant.

10. **Florida Transit Safety Network** - \$133,650 – As noted in item #5 above (Bus Operator Safety Critical Issues Examination and Model Practices), FDOT wanted to take advantage of the excellent results from that report to continue to make transit safer for operators and passengers in Florida. The Florida Transit Safety Network (FTSN) has been established with membership representing each of Florida’s public transit agencies. The FTSN met twice during the reporting period to discuss transit safety issues and opportunities, considered changes to Rule Chapter 14-90, Florida Administration Code, and discuss transit safety program requirements issued in accordance with MAP-21 mandates.

11. **Impact of Transportation Demand Management (TDM) Elements on Managed Lanes Toll Prices** - \$128,091 - The purpose of this research was to quantify the extent to which transit and ridesharing reduce traffic density and lower tolls on the I-95 Express Lanes. The tolls on the I-95 Express Lanes are variable and are based on traffic density. Therefore, transportation strategies that increase person throughput can contribute to lower tolls that benefit the traveling public and improved traffic flow. This research benefits the state because dynamically priced managed lanes feature prominently in the state’s future transportation plans, particularly in South Florida. A draft final report was produced in this reporting period, and the authors were notified that their paper had been accepted for presentation at the 2015 TRB Annual Meeting, and would also be published in TRR.

12. **Capturing the Benefits of Complete Streets** - This project will begin to fill the gap in the literature regarding the economic impacts of Complete Streets projects and how those impacts may differ from more traditional roadway capacity investment projects that do not contain elements of Complete Streets. This research will include a thorough look at the existing literature regarding Complete Streets and a summary of their impacts. Further, the Research Team will determine an appropriate methodology for quantitatively estimating the economic impacts of both Complete Streets and non-Complete Streets projects. Finally, case studies will be used to determine the relative impacts of both types of projects.

13. **Smart Parking Guidance System Demonstration** - This up-to-date information will save students time and the aggravation of the uncertainty of parking and help them avoid wasting fuel driving across campus to another parking lot. This information will help raise awareness and educate students about how transportation options consume different amounts of energy. It will also encourage leaving the car at home altogether and taking a more fuel efficient mode of transportation to and from the campus.
14. **Methodology for Linking Greenways and Parks with Public Transportation in Florida** – The purpose of this project is to provide a methodology to evaluate how intermodal connections between transit and trails can improve livability in Florida communities. The methodology will help evaluate what improvements could be made to existing connections and if there are additional connections that can be made to improve community accessibility. The literature review for the project was completed during this reporting period.
15. **Technology Application Among Florida Community Transportation Providers** - The objective of this project is to gather and disseminate best practices in the application of technology in the paratransit field. The report will provide a comprehensive assessment on how representative agencies deliver successful services provided to ADA and non-ADA riders on demand-responsive mode of transportation. This study will inform the industry on the state of the practice and initiate an exchange among providers in the state of Florida that documents successful practices. This project will particularly focus on collecting successful practices employed by transit agencies and providers in low cost solutions that work as well as innovative practices that have proven to be effective within funding limitations while maintaining good customer service. A survey of all Florida transit systems and all CTCs will be conducted. The participants in the survey will represent different sizes of agencies in both rural and urban settings. The literature review and development of a survey to administer to agencies throughout Florida were completed during this reporting period.
16. **Improving Access to Transit through Crowd Sourced Information** - The purpose of this research is to facilitate the ongoing collection of information about potential areas of multimodal service and infrastructure improvements from the public that can be easily shared with transit agencies, departments of transportation, and city and county governments. This research will enable the capture of various types of data from actual users of public transportation via a real-time transit information system. Using this data, transit agencies, departments of transportation, and city and county government will be able to better target improvements to bike and pedestrian infrastructure for access to transit based on actual transit use and issues reported by the general public. This project was placed under contract with FDOT in this reporting period.

FIU is engaged in the following research projects undertaken with local match:

1. **Informed Traveler Program and Applications – FIU** - \$265,261 - The University City Prosperity Project addresses transportation mobility and safety problems facing Miami-Dade County and the Southeast Florida Region. One of the major components of this project is the development of a first phase of the Informed Traveler Program and Applications (ITPA). ITPA will provide

personalized, timely information and advice regarding the most efficient and cost effective travel paths for consumers in advance of their travel decision points. This would include easy-to-access and use of information needed to avoid congestion, construction, or accident delays and to otherwise optimize each trip; whether and how to use transit or other modes, delay the start of a trip, take an alternate route, and act on secondary destination suggestions, to easily park, and to encourage remote parking with completion of the trip via transit. Matching funds are being provided by the Miami-Dade Expressway Authority. The program's software will be predictive in nature, allowing users to make better travel decisions before they decide whether or not to get in their private vehicles.

2. **Analysis of Movable Bus Stop Boarding and Alighting Areas – FIU - \$110,667** -The goal of this project was to explore the feasibility of creating movable bus stop boarding and alighting areas for Florida transit agencies. This report was completed in May 2013. The specific objectives included: Researching the state-of-the-practice and issues involved in meeting bus stop ADA requirements; Developing design alternative(s) for movable/reusable/relocatable boarding and alighting pads, considering their relation to other bus stop amenities such as benches and shelters; Performing life-cycle cost analysis of each design alternative; and Recommending one or more alternatives that are acceptable to both transit agencies and riders with disabilities. Less expensive alternatives are identified to allow reduce the costs associated with the moving of bus stop boarding and alighting areas.
3. **Guidelines for Bus Transit Stops in Highway Construction Zones – FIU - \$122,600** - The objective of this study is to develop guidelines/recommendations and estimated costs for managing transit stops during adjacent highway construction operations with a focus on safety and the customers. This guidance will serve as a planning tool, design and construction guides for Maintenance of Traffic (MOT) coordination for transit agencies, highway design engineers, and construction managers.

The following projects are being undertaken by UIC with matching funds from the Illinois DOT. These projects provide a full 100% cash match to the portion of the federal grant that is being implemented by UIC:

1. **Igo Car Sharing: Feasibility of Charging Stations for Hybrid Cars** – The objective of this project was to determine the feasibility of placing shared vehicles at or near Amtrak stations and municipal buildings in four Illinois communities to determine potential demand. The project is designed to develop a “last mile” solution to improve access to businesses, universities and centers of commerce. *This project was completed in this reporting period.*
2. **Study of Integrated Corridor Management in Greater Chicago Area** - The Chicago area roadways are chronically congested. This study will attempt to document the efforts made by key stakeholders in the Northeastern Illinois region toward enhancing interconnectivity between various transportation modes to optimally use the supply, reduce travel times for existing riders, and create more travel opportunities for all commuters and travelers. This project is scheduled for completion in October 2015.
3. **Mobility Case Studies: Where Integrated Corridor Management has Worked and Why**

4. **Modeling of Transit Mode Choice in Greater Chicago** - In this study, researchers will adopt a discrete choice modeling approach for the mode choice model and evaluate its performance. The model will provide a state-of-the-art tool that will support a process for forecasting and policy analysis. The project is scheduled for completion in October of 2015.
5. **Ranking Northeast Illinois New Starts Transit Potential Expansion Projects for Metra and CTA** - UIC will develop a method for the ranking of proposed rail transit expansion projects in Northeastern Illinois. This project is scheduled for completion in November of 2015.

North Dakota State University has worked on the following projects as match to the federal grant:

- **Regional Transit Coordination Pilot Project** - This NDDOT SPR Project providing match looks at coordination/mobility managers and better coordinating regions – two specific regions in North Dakota served as the pilots. The project was completed in the previous six month reporting period (\$150,000)
- **Identifying and Satisfying the Mobility Needs of North Dakota’s Transit System** - The objective of this study is to determine the financial needs of the state transit providers. In order to accomplish this, the study will take into account all applicable State and Federal laws and will look into the following:
 1. Construct a demographic profile of the state of North Dakota
 2. Develop a mobility needs index
 3. Describe existing levels of transit service across the state
 4. Identify base levels of required transit service and gaps in existing service
 5. Develop recommendations for meeting mobility needs
 6. Determine the level of funding to maintain the current level of service
 7. Determine the level of funding to expand the existing level of service

What opportunities for training and professional development has the program provided?

- Dr. Jill Hough of NDSU and Dr. Steve Polzin of USF completed the development of modules that have been incorporated into a **national transit course** that will be able to be delivered by any transportation faculty at universities around the country. This course will be ready to offer in the spring semester of 2016.
- Jill Hough presented the training on “Ethics in Decision Making in the Workplace” at the 21st National Conference on Rural Public and Intercity Bus Transportation in Monterey, CA.
- Rob Lynch presented “EMCT: Collaborations and Partnerships” at the National Conference on Rural Public and Intercity Bus Transportation.

- SURTC maintained an education and outreach display booth at the 2014 Dakota Transit Association Fall Conference in Sioux Falls, DS, September 22-24, 2014. SURTC distributed summaries of recent research and displayed information about available training opportunities.
- SURTC maintained an education and outreach display booth at the 2014 American Public Transportation Association EXPO in Houston, TX, October 13 – 15, 2014. SURTC distributed summaries of recent research and displayed information about available training opportunities. SURTC engaged in the same activity at the 2014 National Conference on Rural Public and Intercity Bus Transportation in Monterey, CA, October 26-28 and distributed summaries of recent research and displayed information about available training opportunities.
- NDSU faculty made 4 different presentations at 3 different venues throughout the country as well as one webinar. A total of 208 professionals attended these presentations for a total of 606 contact hours.
- The scopes for virtually every research project noted in this report incorporated **student research assistants** to help prepare them for careers in transportation.
- **The NCTR Scholars program** was initiated the fall of 2013, providing students who have career aspirations in public transportation to obtain a Masters degree in Civil Engineering with an emphasis on public transportation. Two students (Patrick Buddenbrock and Casey Jarrell) graduated in December, 2014 with their masters degrees as the first NCTR Scholars. During this six month reporting period they provided substantial input to two FDOT projects: (1) “Technology Application Among Florida Community Transportation Providers” and “Impacts of TDM on Managed Lane Toll Prices.” They also contributed to collecting information on what transit agencies around the country have done to accommodate truly low income people and people who are homeless. The second paper noted above was selected for publication by The Transportation Research Record. Both Patrick and Casey attended the APTA EXPO in Houston, Texas in October and the Florida Public Transportation Association Annual Meeting in Naples, Florida in November. Patrick Buddenbrock was hired by the Federal Transit Administration as a project engineer in the Region One office in Boston, Massachusetts. Casey Jarrell was hired by the major transportation and engineering firm HNTB.
- USF hosted 9 **free webcasts** in its bi-weekly series to share the results of transportation research with transportation professionals from all over the nation and the world. Five of the 9 webinars shared results of research funded through the UTC grant. An average of approximately 50 people viewed each webcast live, while the recorded versions are available to view on the CUTR website at USF. They are ultimately viewed by more people than the number who watched the webinar live.
- Faculty of USF contributed to the **Florida Public Transportation Association** Annual Meeting held in November in Naples, Florida which was attended by over 350 public transit agency managers. Results of NCTR research were presented at this conference, while numerous NCTR researchers also provided staff support to the Florida Transit Planning Network, the Florida Transit Maintenance Managers Network, and the Florida Transit Safety Network.

- **Florida Transit Operator Trainer Training Program** - \$186,900 – The Florida Transit Operator Trainer Training Program was developed by the FDOT Office of Freight, Logistics, and Passenger Operations. The program provides standardized state and federal curriculum training to Florida’s transit operator trainers. The program has grown to include a voluntary statewide transit operator trainer certificate program, as well as an effective and proactive Florida Operations Network. Additionally, the program works closely with the USDOT’s Transportation Safety Institute (TSI) to develop and offer transit training. The Florida Transit Operator Trainer Training Program provided one classes with 21 participants for a total of 336 training hours during the six month reporting period.
- **Transit Manager Certificate Program** - \$125,147 –The TCMP offers professional development to Florida’s public transportation managers, and provides them with the educational tools and resources necessary to solve today’s public transportation challenges. The program, sponsored and directed by FDOT, is administered by USF’s Center for Urban Transportation Research (CUTR) and offered in cooperation with the University of South Florida’s (USF) Continuing Education’s University College and CUTR. The Program is structured to offer a combination of online courses, self-paced computer based training, traditional classroom courses, and peer to peer exchanges. By being at the forefront of the progressive educational movement and integrating technological advancements, students have easy access to courses that are relevant to today’s public transportation professional. USF’s Transit Manager Certificate Program taught 7 courses that were attended by a total of 67 professionals receiving 804 hours of training during the six month reporting period.
- **Florida Statewide Transit Training and Technical Assistance Program** - \$184,268 - The Florida Statewide Transit Training and Technical Assistance Program provides training and technical assistance to Florida’s transit professionals and FDOT District Offices. The purpose of the program is to ensure the highest level of productivity among transit professionals; promote and encourage management and operational efficiencies; promote and ensure safety and security at Florida’s transit properties; and ensure the provision of more cost-effective transit services. Training and technical assistance is made available to Florida’s transit professionals and FDOT District Office staff including those in operations, planning, marketing, and maintenance. The training and technical assistance is provided in a number of topic areas including professional development, planning, operations, management, marketing, and other topics when deemed necessary by the FDOT Project Manager. The Florida Statewide Transit Training and Technical Assistance Program provided 4 classes with 41 participants for a total of 704 training hours during the six month reporting period.
- The Florida Transit Safety Network (described earlier) provided 1 class with 11 participants for a total of 220 training hours.
- The Transit Maintenance Analysis and Resource Center provided 3 classes with 34 participants and 1184 training hours.

A summary of the transit training provided by USF during the six month reporting period is provided in the tables below:

Training Data for July 1, 2014 - December 31, 2014			
Program	# classes	#students	#contact hours
Florida Bus Operator Trainer Training Program	1	21	336
Statewide Technical Assistance and Training	4	41	704
Substance Abuse Management Oversight/TA Program	2	30	400
Rural Transit Assistance Program	2	22	352
Certified Transit Technician (TMAARC)	3	34	1,184
Transit Manager Certificate Program	7	67	804
Florida Transit Safety Network	1	11	220
Total	20	226	4,000

- Florida Commuter Choice Training Program** – CUTR at USF provides training and instruction annually on Commuter Choice related topics primarily using a combination of live instruction, net conferences, and/or asynchronous distance learning methods (e.g., self-paced online courses). The project also includes course planning, logistics, outreach elements, training materials, and a final report. The scope of work is divided into four distinct tasks, each geared to deliver a high quality-training program. The Commuter Choice Training Program presented 27 training modules during the six month reporting period, providing training on subjects including but not limited to Telework and Alternative Work Schedules, Transit Service Options, and Measuring Performance under the Commuter Choice certificate and the Social Marketing in Transportation certificate. Participation in these sessions resulted in the following totals: 380 people participated in the live presentations; 81 others participated in the recorded sessions; there were 461 contact hours of training provided.

Table 1. Commuter Choice Courses Conducted This Period

Date	Module	Credits	Participants (Live)	Recording Views	Total Contact Hours
7/2/2014	Telework and Alt Work Schedules – Session 1 of 3	4	9	3	12
7/9/2014	Telework and Alt Work Schedules – Session 2 of 3		10	2	12
7/16/2014	Employer Commute Program Case Studies – Session 1 of 2	2	10	3	13
7/23/2014	Transit Service Options – Session 1 of 3	4	10	8	18
7/30/2014	Telework and Alt Work Schedules – Session 3 of 3		5	3	8
8/13/2014	Transit Service Options – Session 2 of 3		9	6	15
8/20/2014	Introduction to Parking Management – Session 1 of 2	2	11	2	13
8/27/2014	Employer Commute Program Case Studies – Session 2 of 2		8	7	15

Date	Module	Credits	Participants (Live)	Recording Views	Total Contact Hours
9/3/2014	Introduction to Parking Management – Session 2 of 2		13	4	17
9/10/2014	Transit Service Options – Session 3 of 3		10	7	17
9/17/2014	Measuring Results and Performance – Session 1 of 3	4	10	7	17
9/24/2014	TDM in Land Development – Session 1 of 2	2	9	2	11
10/1/2014	Measuring Results and Performance – Session 2 of 3	4	10	2	12
10/8/2014	TDM in Land Development – Session 2 of 2	2	8	2	10
10/15/2014	Measuring Results and Performance – Session 3 of 3		8	0	8
TOTAL		24	140	58	198

- **Table 2. Social Marketing in Transportation Courses Conducted This Period**

Date	Module	Credits	Participants (Live)	Recording Views	Total Contact Hours
10/31/2014	Social Marketing overview and orientation	1.5	17	8	25
11/7/2014	Conducting a Situational Analysis	1.5	17	12	29
11/14/2014	Defining the Problem and Identifying the Behaviors and Segmentation	1.5	18	3	21
11/21/2014	Understanding Your Market via Formative Research	1.5	12	0	12
12/14/2014	Creating Your Social Marketing Program Strategy	3.5	22	0	22
12/15/2014	Introducing the Social Marketing Plan	1.0	22	0	22
12/15/2014	Identifying Creative Solutions for Addressing Priority Group Needs and Behaviors	2.5	22	0	22
12/15/2014	Developing the Marketing Brief	4.0	22	0	22
12/16/2014	Developing the Marketing Plan	1.5	22	0	22
12/16/2014	Testing the Concepts	2.0	22	0	22
12/16/2014	Preparing the Marketing Plan	2.0	22	0	22
12/16/2014	Team Final Presentations	1.5	22	0	22

Date	Module	Credits	Participants (Live)	Recording Views	Total Contact Hours
TOTAL		24	240	23	263

How have the results been disseminated? If so, in what ways?

PIs for all projects have established peer reviewers who are most likely to be interested in the results and in a position to implement findings. PIs have also been instructed to identify opportunities to share results of research through webinars, conferences, and direct notification to lists of professionals that have been identified in advance of conducting the research. USF’s webcasts are free to all participants and can be viewed in real time, or viewed as a recording at the viewer’s convenience. An average of approximately 50 people view each webcast on a live basis, with many more watching the webinars on a recorded basis at a time convenient for them. **During this six month reporting period**, consortium members made 15 presentations at professional conferences including APTA, state association transit conferences, the Rural Public Intercity Bus Transportation conference, and webinars. In addition, one paper based on NCTR research was published by TRB.

USF’s TDM program has developed a knowledge base (KB) to reduce the inquiry burden on Clearinghouse staff by providing an intelligent self-service option by providing information on hundreds of frequently asked questions as well as case studies and examples. This approach provides a means to reduce the total number of basic inquiries or repeat requests that require personal attention. It also allows staff to respond quickly to inquiries drawing on the information in the KB. The objective is to be more cost-effective and to handle more interactions by providing lower cost transactions with the KB's self-service feature. During this reporting period there were 1,046 searches. The number of answers viewed continues to grow significantly.

Dr. Steve Polzin, Dr. Pei-Sung Lin, and Lisa Staes presented at the Tampa Bay Applications Group at FDOT, District 7 in Tampa, on August 21st in regards to their research on how changing technologies and demographics influence travel behaviors and transportation safety. The following topics were addressed: Dr. Polzin — *What in the World is Going on with Travel Behavior—from Millennials to Uber to Autonomous Vehicles* and Dr. Lin and Lisa Staes— *Moving Toward Safer Travel—Initiatives to Understand and Improve Travel Safety*.

On September 29, 2014, the Department of Transportation hosted the first University Transportation Center (UTC) Workshop on Pedestrian and Bicycle Research. Approximately 35 participants from across USDOT and the UTCs participated in the intensive 3-hour session. Included were a poster session, focusing on the research being conducted at UTCs and within the Department, and subsequent roundtable discussion. Dr. Pei-Sung Lin and Julie Bond of USF attended this session and provided posters showing the various ways their research and technical assistance have led to greater safety for pedestrians and bicyclists.

Lisa Staes participated in an APTA webinar on September 24, 2014 focused on bus operator safety in which she provided summarized information on the results of her NCTR report entitled “Bus Operator Safety – Critical Issues.”

What do you plan to do during the next reporting period to accomplish the goals and objectives?

During the next six months another five of the projects identified and established in the grant will be completed. NCTR will energetically share the results of the research projects with sponsors and with all other parties that can benefit from the findings through every technology transfer avenue available. Webinars featuring results from these projects will be held every two weeks, and opportunities to present findings at professional transportation conferences will also be pursued as normal. Final drafts of all research projects will be peer reviewed. The ongoing training programs will continue in the next six months based on input received from operating agencies requests, while preparations for the GIS in Transit conference to be held in October 2015 in Washington, DC will continue. The development of training modules for the national public transit course will be completed and scheduled to be taught in the Spring of 2016. New students for the NCTR Scholars program will be selected and placed with faculty members as graduate research assistants, and they will be given the opportunities to attend TRB and the FPTA Annual conferences. The NCTR website will be updated to include the completed research reports from all four consortium members.

Products

Publications

Two editions of the Journal of Public Transportation (Volume 17, issues #3 and #4) were produced during this progress report period featuring a total of 19 papers. Volume 17 No.4 represented the first edition of the Journal to be produced in electronic format only, saving the project approximately \$30,000 per year which can be reprogrammed into additional reviews and other projects under NCTR. New members for the Journal's Editorial Board were contacted to determine their interest in serving, though the Board was not yet reconstituted. The Journal is now receiving over 10 papers a month for consideration for publishing (approximately 40 papers are published annually). The list of professional reviewers now numbers over 150.

Websites

The website for NCTR (www.nctr.usf.edu) has been in place since 1999 and remains very active. NCTR is rated #2 for "transit research" results on Google, Bing and Yahoo search engines. It includes information on the center's history, key personnel, research activities, links to all reports and webinars, the various programs and clearinghouses hosted by NCTR, all volumes of the Journal of Public Transportation, and a section on career opportunities in transit. It has been updated to include the contact information for the directors of the research centers at NDSU, FIU, and UIC. The links to their websites (<http://www.surtc.org/>; <http://lctr.eng.fiu.edu/>; <http://www.utc.uic.edu/>) have also been included. Those websites also include information on key personnel, active research, downloadable reports, student participation in their programs, and webinars that can be viewed. The NCTR website will continue to be updated to include all projects completed by consortium members and the projects

yet to be undertaken through the federal grant and matching funds. Statistics on visits to the website are:

- The numbers of sessions are up 7.19% to 31,153 for Jul-Dec 2014 vs 29,062 for Jan-Jun 2014. A session is the period time a user is actively engaged with our website. All usage data (Screen Views, Events, etc.) is associated with a session.
- The numbers of users are up 7.67% to 26,096 for Jul-Dec 2014 vs 24,236 for Jan-Jun 2014. *Users* have had at least one session within the selected date range and includes both new and returning users.
- The number of pageviews are up 8.26% to 60,117 for Jul-Dec 2014 vs 55,530 for Jan-Jun 2014. *Pageviews* are the total number of pages viewed. Repeated views of a single page are counted.

A website for the National Transit Safety Research and Assistance Center (<http://transitsafetycenter.org/>) was also established during this six month reporting period.

Technologies or Techniques – TRIMMS (Trip Reduction Impacts of Mobility Management Strategies), a software package developed by NCTR to enable policy makers to determine what TDM techniques are most effective to reduce VMT, congestion, and pollution, was the only software mentioned by name by EPA in *“Commuter Programs: Quantifying and Using Their Emission Benefits in SIPs and Conformity - Guidance for State and Local Air and Transportation Agencies.”*

California is updating Transportation Impacts Analysis in the CEQA Guidelines where “automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment.” They cite TRIMMS and CUTR_AVR in their catalog of the many models that generate estimates of VMT.

Work performed by NCTR researchers in collaboration with Georgia Tech and the University of Washington resulted in the implementation of “OneBusAway” software for the Hillsborough Area Regional Transit Authority in Tampa, Florida. This public domain software, developed by the three noted universities, allows passengers to know when the next bus is arriving in real time through their cell phones. HART officials received nothing but positive feedback from customers and believe OneBusAway is contributing to ridership increases.

Inventions, Patent Applications, and/or Licenses – The six month reporting period was once again notable for another patent received by USF made possible by research funded by the UTC grants. The following patent was awarded during the reporting period:

U.S. Patent # 8,843,315 – System and Method for Spatial Point-of-Interest Generation and Automated Trip Segmentation Using Location Data – An algorithm that creates points-of-interests (e.g., Home, Work) from raw tracking data (e.g., GPS). These points-of-interest are then used to segment the raw tracking data into discrete trips from one location to another. The amount of time that the user spends at a particular point-of-interest, and when they arrive at and depart from each point-of-interest is also calculated. Issued September 23, 2014, U.S. Patent and Trademark Office.

In addition, a private firm, EmergenSee, licensed USF's WiVia patent for reporting location-based pictures/video to emergency responders.

Other Products

The Federal Transit Administration issued guidance that it would be rescinding previous circulars that provided directions on how to conduct National Transit Database sampling. This was based partially on research conducted at NCTR in which new sampling techniques were developed that saved transit agencies time and money, and provided more accurate results.

Participants and Collaborating Organizations

What organizations have been involved as partners?

The National Center for Transit Research (NCTR) is a consortium of four universities as follows:

- University of South Florida located in Tampa, Florida, featuring the National Center for Transit Research (NCTR), a Tier I UTC that is part of the Center for Urban Transportation Research, contributing to the program financial support and collaborative research.
- North Dakota State University located in Fargo, North Dakota, featuring the Small Urban & Rural Transit Center (SURTC), a Title III UTC, contributing to the program financial support and collaborative research.
- University of Illinois at Chicago located in Chicago, Illinois, featuring the Urban Transportation Center (UTC) in the College of Urban Planning and Public Affairs, contributing to the program collaborative research.
- Florida International University located in Miami, Florida, featuring the Lehman Center for Transportation Research (LCTR), contributing to the program collaborative research.

As described earlier in this report, the four universities are collaborating on four different projects, lending their expertise toward completing research reports. Collaboration with other parties has been quite extensive as noted below:

1. **The Federal Transit Administration** – The FTA has been a fully engaged partner not only in its role as the source of federal funds for the program for the two transit-focused UTCs, but as a source of ideas for research projects to be undertaken. FTA established an internal process to solicit, screen, and submit research ideas to the two transit-focused UTCs to be funded through both the first and second year of the federal grant. FTA submitted eight project proposals. Four of them are being completed by USF's consortium and three were undertaken by the San Jose State consortium. FTA staff have served as peer reviewers of the projects.
2. **The Florida Department of Transportation** – FDOT has been a vital partner in the development, selection, and funding of the majority of the research that will be conducted by USF and FIU researchers under this grant. FDOT is providing cash match to USF's and FIU's portion of the grant. It is also providing project managers for each project to manage and oversee the

completion of each project done by USF and FIU. Similar arrangements have been made with the Illinois and North Dakota Departments of Transportation. **IDOT** is providing a full cash match to UIC's portion of the grant, while **NDDOT** is providing approximately one-third cash match.

3. **The Florida Public Transportation Association** – FPTA, in conjunction with FDOT, is collaborating on a number of training projects through the engagement of various public transit networks (e.g., Transit Operations Network, Planning Network, Maintenance Network) to serve as advisors and peer reviewers of research projects. Several Florida transit agencies are also providing vital information for some of the research projects and the time and effort they have devoted has been indispensable to the success of the projects.
4. **The Washington State Department of Transportation** has provided full cash match funding for the project entitled “Incorporating Managing Demand into Washington State DOT Planning and Programming.”
5. **The Florida Commission for the Transportation Disadvantaged** served as the project managers and reviewers of the project entitled “Impacts of Dialysis Transportation on Florida's Coordinated Public Transportation Programs” and provided final approval of the report in the last six months.
6. Consortium members have worked closely with the **American Public Transportation Association** on the Higher Education Subcommittee of the Human Resources Committee; with the Research and Development Committee on making a closer connection between UTC transit research results and APTA members; with the Alternative Fuels Committee in providing information for NCTR's Advanced Transit Energy Portal; and with the Bus Safety Committee. A draft Memorandum of Agreement between CUTC and APTA was discussed at the APTA Annual Meeting in October 2014 and further meetings have been scheduled to formalize an agreement of cooperation.
7. USF has collaborated with the **Texas Transportation Institute** in developing a new methodology to determine the impact of transit services on roadway congestion for its Annual Congestion Study.
8. USF collaborated with the **Mineta Transportation Institute** to provide two case studies for a report dealing with best practices in improving access to transit services for disabled people.
9. USF updated the Commuter Benefits brief for 2014 and placed it on **Commuterservices** and Best Workplaces for Commuters' websites. <http://www.bestworkplaces.org/resource-center/free-ebook-commuter-benefits/>
10. The TDM group continued planning with the Florida Prevention Research Center with USF College of Health for their 2nd Social Marketing in Transportation certificate.
11. The **Association for Commuter Transportation** presented **The President's Award** to CUTR as the “Partner of the Year” for CUTR's many programs that promote alternative forms of transportation to reduce congestion and pollution, and also presented the ‘Excellence in Scholarship’ award to NCTR researchers for the project entitled “Improving Cost Effectiveness of Financial Incentives in Managing TDM” described earlier in this report.

12. NCTR Director Joel Volinski participated as part of the Problem Statement Screening Panel to help ensure no research projects selected for TCRP would duplicate ongoing research.
13. NCTR Director participated as a member of the Executive Board of the National Institute for Transportation and Communities to identify research priorities and share information on the activities as USF. He also served as the Vice President of the Council of University Transportation Centers, and together with Dr. Jill Hough, helped to redesign the CUTC website so it would be more usable to UTCs around the country.
14. CUTR's Advanced Geo-Spatial Informatics Laboratory (AGIL) collaborated with the FDOT District 7 GIS Coordinator to kick off the Tampa Bay GIS User's Group (TBGIS). The first meeting of TBGIS took place on October 17 at the FDOT District 7 auditorium and was attended by over 120 GIS professionals from the Tampa Bay area. Martin Catala and Donald Hayward presented on the opportunities presented by open source GIS web applications, highlighting experiences with open source GIS in past projects.
15. CUTR's Transportation Program Evaluation and Economic Analysis program, partially funded through NCTR projects dealing with alternative fuels, staffs a statewide legislatively created committee to make recommendations on cleaner transportation fuels to the governor and state legislature; works with FDOT on an ongoing project to evaluate the performance of alternatively fueled buses; assists FTA with its transit electrification research plan and other fuel-related research; established the Tampa Bay Clean Cities Coalition; and received grants from the University of Central Florida to assist in developing markets for alternative fuel vehicles.
16. Safe Routes to School Tampa Bay, a program administered by CUTR, presented at the 2014 Great American Teach-In Day event(s) at Witter Elementary, Robles Elementary, Summerfield Crossings Elementary and Terrace Community Middle Schools in Hillsborough County. Staff provided a total of twelve pedestrian and bicycle safety presentations for students with a Q & A session at the end. The purpose of the presentations was to provide pedestrian and bicycle safety, and get the students thinking about their current and future transportation options.
17. Steve Polzin, Director of CUTR's Mobility and Policy Research Program, received Certificates of Appreciation for service on the Hillsborough Area Regional Transit Authority Board of Directors from the HART Board and from the County Commission. HART service included two terms from 1999 to 2005, a partial term from 2007-2008 and two terms from 2008-2014. He also served as the HART representative to the Metropolitan Planning Commission Board from 2002-2005 and from 2010-2014.

Many organizations have lent their considerable experience and expertise to NCTR by agreeing to have representatives serve on the NCTR Advisory Board. Included among them are:

Michael Melaniphy, President – American Public Transportation Association

David Spacek, Public Transportation Office – North Dakota Department of Transportation

Tim Garling, Director, Broward County Mass Transit Division – President, Florida Public Transportation Association

Ed Coven, Manager, Public Transportation Office, Florida Department of Transportation

Darryll Dockstader, Manager, Research Office, Florida Department of Transportation

Bill McCloud, Senior Vice President, Veolia Transportation

Donna Vlasak, Senior Program Officer, The National Academies, TRB

Jon Martz, Vice President, Van Pool Services, Inc.

Joe Calabrese, GM/CEO, Greater Cleveland Regional Transit Authority

Michael Baltes, Director – Office of Technology, Federal Transit Administration

Dr. Minnie Fells Johnson, Chair, Project for Public Spaces

Perry Maull, Director – Indiana University Bus Services

Have other collaborators or contacts been involved?

Most of the significant collaboration has been described in previous sections. It should be noted again that consortium members are collaborating on four projects listed in the federal projects to be undertaken after discussions were held with the Mineta Transportation Institute. NCTR completed two case studies on a federally funded project headed by MTI that identifies ways to improve access to transit stops for people with disabilities.

Impact

What is the impact on the development of the principal discipline(s) of the program?

As noted earlier, FDOT accepted the report entitled “**Improved Traffic Control Measures to Prevent Incorrect Turns at Highway-Rail Grade Crossings.**” With the information collected through this study, FDOT has awarded another contract to USF to continue work on this subject through the deployment and testing of the remedies that were identified in the initial study in as many as six locations throughout the state.

The project entitled “**Investigation, Quantification, and Recommendations - Performance of Alternatively-fueled Buses**” was completed and the Advanced Transit Energy Portal continued to provide information on the pros and cons of alternative fuels. During this time frame, two transit agencies in Florida (Lynx in Orlando and the Jacksonville Transportation Authority), aided to some extent by the information developed by NCTR, decided to switch to compressed natural gas, while two other

agencies (Palm Tran in Palm Beach County and Broward County Transit) will now order paratransit vehicles that run on propane.

The most important outcome/potential outcomes of the report entitled “**Bus Operator Safety Critical Issues Examination and Model Practices**” are those activities underway and planned to modify Florida state law and individual transit agency policies and procedures related to training (which includes assault prevention) and criminal history background checks. Activities include:

- Florida Operators Network (FON) and the Florida Transit Safety Network (FTSN) have established “Minimum Fixed-Route Bus Operator Training Guidelines” that have been distributed statewide - this research study contributed to the completion of this process, recognizing the importance of transit operator training in how they can help de-escalate situations to contribute to the reduction of incidents.
- FON and FTSN will be establishing “Minimum Fixed-Route Bus Operator Annual Refresher Training Guidelines” (which will include assault avoidance/defusing volatile situations module). This was discussed at network meetings occurring in September and a committee has been assigned to develop the guidelines
- FDOT will begin rule change processes in the immediate future. Potential modifications to Chapter 14-90, Florida Administrative Code, governing “Equipment and Operation Standards for Bus Transit Systems” will likely include minimum training standards and the requirement of Florida’s transit agencies to perform Level 1 Criminal History Background Checks for new bus operator hires and could also include rechecks on a specific rotation (every 2 years as an example).

What is the impact on other disciplines?

FDOT has funded a series of training workshops on the results of the research associated with the project entitled “Multimodal Transportation Best Practices and Model Elements.” Through the workshops, the FDOT project manager and NCTR are soliciting feedback from participants on use of the report and also will be identifying potential locations for pilot application of the model elements. A goal of the pilot applications will be to provide additional guidance and further refine the research results. Each workshop participant is being asked to follow up with USF as to how they have used the research.

What is the impact on the development of transportation workforce development?

Patrick Buddenbrock was selected as the [National Center for Transit Research Student of the Year](#) for 2014. Patrick graduated in December 2014 with a Master of Civil Engineering with an emphasis on transportation. He earned a 3.83 GPA, co-authored a paper that was accepted for publication by TRB, and served as the Vice-President of the Engineering Honor Society at USF. Patrick made important contributions to a number of research projects undertaken at CUTR and played a key role in developing alternatives for future corridors in Florida requested by the FDOT. As the NCTR Student of the Year, Patrick received a \$1,000 scholarship and made plans to attend the CUTC Transportation Awards Banquet that kicks off the TRB Annual Meeting. When first entering the USF Masters program, his intent

was to work with the FHWA. However, given his involvement and exposure to transit issues while being an NCTR Scholar, he changed course and accepted a position with the Federal Transit Administration.



SURTC developed a module training “FTA 101” with American Association of State Highway and Transportation Officials (AASHTO). This module is designed to help DOT and new transit managers understand the basics of the Federal Transit Administration (FAR0022506). This training was attended by 20 professionals in San Jose, California in the prior reporting period.

The results of the various training programs conducted by USF and NDSU were documented in the section entitled **“What opportunities for training and professional development has the program provided?”**

The Transit Management Certificate Program graduated its first class (13 members) in May, 2014 and advanced the careers of the following participants: (1) One enrolled as the Superintendent of Paratransit Operations, and is now the Executive Director of the agency (2) One enrolled as a maintenance superintendent, and is now the Maintenance Director of a larger agency and (3) One enrolled as a grants analyst, and is now a FDOT Area Office Director.

The Florida Transit Operator Trainer Training Program program has grown from three (3) transit properties participating to 41 transit agencies represented in the program. In 2000, there were five (5) trainers participating. By June 30, 2014 there are 123 active participants working towards their Florida Transit Operator Trainer Training certificate. Since 2000, the program has graduated 105 participants (including 25 who were awarded their certificates at the Professional Development Workshop in June 2014). Three graduates of the program are now Transportation Safety Institute Associate Staff members. Another participant was promoted from Operations Supervisor to Assistant General Manager.

In summary, 62 classes were provided to 3,052 participants who received 13,224 contact hours of training through the programs that match the federal grant during the six month reporting period.

What is the impact on physical, institutional, and information resources at the university or other partner institutions?

All of the consortium partners represent well established universities with long standing research programs. The grant has not resulted in any significant capital improvements, but it has provided the funds to permit research faculty to manage things such as listservs and webinar series that provide a wealth of information to the thousands that participate at no cost to the participants.

What is the impact on technology transfer?

NCTR has been a leader in providing webinars that are free and can be watched on a live or recorded basis. This helps to minimize expense to those who participate since they can do so from their offices or other remote locations. Over 900 people have watched the webinars during the six month reporting period. NCTR has also been a leader in the management of listservs that allow flexible and frequent communication among transportation professionals on a variety of subjects. Some decisions cannot wait many months or years for research to be completed, but the listservs allow participants to share information and provide mutual assistance by providing all participants with the best information available.

The TDM Listserv now has 2,410 members after another 90 people joined during the six month reporting period. NCTR manages these listservs with the intent of transferring information within this large transportation community. During the six month reporting period, over 620,000 messages were successfully transmitted.

The website for NCTR (www.nctr.usf.edu) was described on page 22 of this report.

What is the impact on society beyond science and technology?

The Best Workplaces for Commuters program encourages more employers to gain recognition by offering commute alternatives to their employees thereby reducing traffic congestion and air pollution, improving health through more walking and biking, and allowing employees to do something more beneficial with their income than to fill up gas tanks. Over 300 employers throughout the country have earned the designation as a Best Workplace for Commuters.

Dr. Steve Polzin, Director of Mobility Policy Research at NCTR/CUTR, was selected as a member of the Committee for Study of Innovative Urban Mobility Services by the Transportation Research Board (TRB) Executive Committee. This ad hoc committee will examine the growth of new on-demand and peer-to-peer mobility services and explore the implications these services have for consumers and existing transportation services. The study will identify policy, regulatory, and other issues that policy makers will need to consider as they regulate these services, including the existing regulatory structure for taxi, limousine, and transit services. Priority areas of research to inform public policy decisions will also be identified. The committee's first meeting to take testimony from industry stakeholders was held in early July 2014. This effort is scheduled to produce a report within approximately 15 months.

Sean Barbeau, Phil Winters, and Nevine Georggi coordinated efforts with USF Division of Patents and Licensing to find potential licensees for several of their patents. Their technology (including a patent) to help mobile phone users alert first response teams of emergency situations was licensed to the company EmergenSee (<http://emergensee.com/>). This technology, noted earlier and developed through UTC funding, will help save lives for those who need immediate care due to accidents on our highways. (<http://www.bizjournals.com/tampabay/news/2014/07/09/new-tech-at-usf-helps-alert-response-teams-during.html>)

The third annual “Bulls Walk and Bike Week” was successfully held from September 2-5, 2014. CUTR received tremendous support from FDOT Central office and District 7, MPO, TBARTA, the College of Engineering, USF Police, EH&S, COPH, Bull Runner, Administrative Services, and Student Government. The theme was to “Walk Wise, Bike Smart, and Drive Carefully.” The week started with a Press Conference and stroll around campus with USF President Judy Genshaft. Events included a Complete Streets Open House at the Marshall Center, Walk Wise and Bike Smart safety presentations, a Bicycle Celebration event, and a Cycling Savvy course. Numerous prizes were provided for participation throughout the week including t-shirts, sunglasses, first aid kits, reflective gear, helmets, and ten free bicycles donated by local sponsors.

The **Tampa Bay Clean Cities Coalition (TBCCC)**, a partnership between the University of South Florida, the Environmental Protection Commission of Hillsborough County, and TECO Energy, celebrated its official designation under the national Clean Cities program by the U.S. Department of Energy (DOE) during a November 17 ceremony. CUTR is a founding member of the coalition, which promotes the use of advanced transportation fuels and technologies in the Tampa Bay region. The ceremony, held at the Patel Center for Global Solutions, included a display of alternative fuel vehicles from coalition members - Tampa International Airport, Precision Alternative Fuel Conversions, and Florida Transportation Systems. Also on display were a couple of the latest electric vehicles, a Tesla Model S and a BMWi3. Linda Bluestein, National Clean Cities Co-Director, spoke about the Clean Cities program, which has saved nearly 6.5 billion gallons of petroleum since 1993. She presented USF with a plaque from DOE commemorating the coalition’s designation and in recognition of its “leadership and commitment to reducing petroleum dependence and improving air quality.” The highlight of the ceremony was the certification presentation to coalition members, acknowledging their shared commitment to the Clean Cities program. Many of the 30-plus public and private organizations are already using successful petroleum displacement initiatives. Federal designation will help the Tampa Bay region to identify funding opportunities for clean fuel projects through a network of partners on the cutting edge of alternative fuels. The coalition’s efforts going forward will continue to support the Clean Cities petroleum displacement goals. The U.S. Department of Energy will work closely with the coalition, providing national program resources to assist in outreach and educational efforts.

The “Excellence in Scholarship Award” from the Association for Commuter Transportation was awarded to the team of Chanyoung Lee, Phil Winters, Debbie Shultz, and Joan Pino for the NCTR project, “Improving Cost Effectiveness of Financial Incentives in Managing TDM” in August 2014. The Excellence in Scholarship award acknowledges an ACT member for recent scholarly work in transportation demand management, one of its sub-disciplines, or in a related field when the research demonstrates applicability to TDM goals.

The “President’s Award” from the Association for Commuter Transportation was awarded to CUTR for everything USF’s TDM program does to assist the association’s members such as webinars, hosting the TRANSP-TDM listserv, research, training, and other things in August 2014.

Changes/Problems

One member of the NCTR Advisory Board (Dr. Mary Leary) resigned from the Board since she was joining FTA in Washington, which already has a representative on the Board. She has made recommendations on possible replacements. Kim Adair has also left the Board and NDSU is identifying another NDDOT staff member to replace her.

Changes in approach and reasons for change

Dr. Eric Welch of UIC has left UIC and joined the faculty at Arizona State University. He will continue to be the PI for the project titled “Adapting Transit to Climate Change Impacts” which is two-thirds finished, with assistance from Dr. Sriraj of UIC.

Actual or anticipated problems or delays and actions or plans to resolve them

There are no anticipated problems due to delays. All subcontracts are well in place among consortium members and all funds are dedicated toward projects that have already been identified and scoped.

Changes that have a significant impact on expenditures

Nothing to report.

Significant changes in use or care of human subjects, vertebrate animals, and/or biohazards

Nothing to report.

Change of primary performance site location from the originally proposed

Nothing to report other than the move of Dr. Eric Welch from UIC to Arizona State University.

Additional information regarding Products and Impacts

Outputs

Nothing more to report

Outcomes

Nothing more to report.

Impacts

Nothing more to report.

Special Reporting Requirements

Nothing to report.